

# **Labelling machine**

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## **Abstract of DE 19821546 (C1)**

A sticky label is applied to positions lying in two different planes on the surface of an object carried through the machine (1) on a conveyor. Individual labels are stored in a dispenser device (17). A manipulator device (16) for receiving, holding and applying the dispensed labels is mounted on a rotatable arm (13). This manipulator device is mounted in the free end (130) of the arm and can be moved at right angles to the arm length axis (4).

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The invention relates to a method for applying labels by means of the labels of female manipulator on the surface in a conveying direction along a conveyor track at the manipulator of by-required subject-matter, whereby the labels in two labeling positions located in various planes become applied on the subject-matter.

The invention relates to furthermore an apparatus for applying labels on the surface of a subject-matter, whereby the labels are applyable on the subject-matter in two labeling positions located in various planes, with a dispenser to the delivery single labels and with a manipulator, by-required in a conveying direction along a conveyor track at the apparatus, for taking up, stops and applying of the labels delivered by the dispenser, whereby the manipulator is more swingable around a swivelling axis swingable supported and from an home position outside of the conveyor track around the swivelling axis into the conveyor track of the subject-matter.

The label of subject-matters, z. B. a product and/or. its package attain an always large becoming significance due to the necessary information exchange between manufacturers, commerces and final customer, whereby marking represents a particularly simple and powerful possibility by means of printed and preferably self adhesive labels. Examples for the need of a such label of the products by means of labels are in commission-more based or to Just in Timeproduction, in the quality assurance and traceability of products as well as with the adherence to legal defaults by certain product designations, danger references or minimum durability data, which are to be attached on the product. Also in the area of the logistic controller and effective storekeeping as well as with the Tracking and Tracing and the logging of transport paths various application examples for the product marking result by means of applyable labels.

With various applications an identification of a subject-matter becomes, z. B. the product and/or. its package in two labeling positions on the surface of the subject-matter required, located in various planes, whereby the complexity of the informations which can be attached and. And. the attachment of very large sized labels with corresponding many informations requires.

There is already therefore series of labeling devices proposed, one automated applying of preferably self adhesive labels in two labeling positions on subject-matters, located on various planes, as palettes or cardboard boxes make possible, whereby these usually automated are led past by a conveyor the labeling device.

From the DE 40 31 891 A1 proposed is as a possibility of the mounting of two labels in two various labeling positions that the subject-matter of the labeling device which can be labeled supplied and there stopped will, in order to apply by means of a manipulator on the face of the same located in traveling direction of the subject-matter a label. Subsequent one is full-led by means of two or more linear drives a very expensive two or three-axis movement of the manipulator, applied with which an other label which can be attached becomes to the second labeling position brought and on the subject-matter there. Here required stoppings of the movement of the subject-matter which can be labeled however extraordinary undesirable, there thereby to the clock achievement of the labeling device, is D. h. the number per unit time which can be labeled of the subject-matters reduced and to other increased costs due to an increased control and regulation expenditure conditional become.

In the WHERE 97/32 785 A1 proposed, applying labels in two labeling positions on the surface one, located in various planes, at the labeling device of moved by subject-matter both labels of a label delivery mechanism, which can be applied in one labeling position each on the surface of the subject-matter, on a controlled propelled suction belt, becomes z. B. to hand over on a drum or a circumferential tape. This suction belt swings then into the path of movement of the subject-matter and unreels themselves to the transmission of the labels the corresponding article outlines and the speed of the subject-matter over its surface. Adverse one with these known labeling devices is it that they are more insertable only on angular adjacent surfaces of the subject-matter together, not however on irregular shaped surfaces, since the suction belt is planar and the label becomes from this only pressed one. Beyond that the suction belt presses against the surfaces which can be labeled, whereby with very sensitive subject-matters a damage is not to be excluded always.

From the DE 33 01 439 A1 an apparatus is known for applying adhesive labels, which also at its free end disposed suction head for label mounting at the subject-matter exhibits a tubular label arm propelled by a motor. The label arm is elastic formed thereby and in a direction of rotation driven, in order to provide two adjacent sides of the subject-matter with labels. A such apparatus is more insertable however only at relative small subject-matters and with small positioning accuracy and can also only applying relative kleinformatiger labels used become, which limits the insert portion strong.

An other labeling device become known from the state of the art suggests two label manipulators which can be equipped with labels, those from a movable label delivery mechanism the labels obtained which can be applied. Here however the label which can be applied on the face of the subject-matter can become only very close at the edge of the subject-matter mounted formed between both surfaces and labeling regulations, z. B. the so called CCG regulations can and. And. no more not to be kept. With subject-matters with irregular edge training, z. B. with stacked bag commodity this prior art method is besides not more insertable and it is only very small labeling speeds and numbers of cycles possible.

The invention has itself the object provided to improve the prior art methods and apparatuses that initially mentioned type going by that an high number of labels per unit time on the surfaces one subject-matter which can be labeled in two labeling positions applied to become to be able, whereby no stoppings of the subject-matter for labeling more necessary is to be and applying of the labels becomes unobstructed also with irregular and/or sensitive surfaces of the subject-matter made and an high positioning accuracy of the labels possible which can be labeled, as they are for example required for the use of automated label read systems.

Beyond that it should be possible to apply the labels alternatively either only in one or in both labeling positions on the surface of the subject-matter.

This object becomes according to invention by a method in accordance with the characterizing features of the claim 1 or 2 dissolved.

An apparatus according to invention to the solution of the object posed is subject-matter of the claim 17.

Advantageous embodiments of the invention are more removable the Unteransprüchen.

To the solution of the object posed the invention suggests a method, with that

a) applying a label in a labeling position located in conveying direction a manipulator outside of the conveyor track with a label charged and the manipulator for applying the label on the subject-matter a pivotal movement in the conveyor track and one becomes the pivotal movement leading rectilinear movement implements, whereby the label is against-driven to the subject-matter up to the contact with the surface of the same by the manipulator and to applying the label the manipulator a back lagging from the conveyor track and one the back lagging hastening after rectilinear return movement implements and

b) applying a label in a labeling position located transverse to the conveying direction a manipulator outside of the conveyor track with a label charged and the manipulator for applying the label on the subject-matter a rectilinear movement transverse to the conveying direction into the conveyor track up to the contact with the surface of the subject-matter implements and after applying the label the manipulator a rectilinear return movement from the conveyor track becomes implements.

By this formation it becomes possible, by means of the manipulator both a label on the side pointing in conveying direction, D. h. the face of the subject-matter by movements in accordance with feature A) to apply, like it also possible is, subsequent on a side directed transverse to the conveying direction, D. h. to apply a longitudinal side of the subject-matter a corresponding label by movement of the manipulator in accordance with feature b).

When applying the label on the face of the subject-matter by movements of the manipulator in accordance with feature A) by those leading rectilinear movement of the manipulator the label the subject-matter is against-driven to the pivotal movement against its conveying direction, so that the position for applying the label, D. h. the position, with which the manipulator with the face of the subject-matter which can be labeled comes into contact, against the conveying direction of the subject-matter around the length of the implemented rectilinear movement of the manipulator becomes forced. By this Vorverlegen additional time for that becomes applying the label subsequent back swivelling and the hastening after rectilinear back moving of the manipulator into its original position recovered with the invention process. Thereby is ensured that the one the subject-matter on the conveyor track, which can be labeled, does not have to become stopped during the Vorbeiförderns at the manipulator and applying the labels in its promotion movement slowed or. On the other hand the manipulator remains by preceding explained forced applying of a label on the face of the subject-matter after the back swivelling and back moving for a sufficient long time in its original position, in order to become during the continuous other promotion of the subject-matter with the second label for labeling the longitudinal side of the subject-matter in accordance with feature b) charged and to apply this subsequent on the subject-matter.

An alternative embodiment of the invention process plans that

- a) applying a label in a labeling position located transverse to the conveying direction a manipulator outside of the conveyor track with a label charged and the manipulator for applying the label on the subject-matter a rectilinear movement transverse to the conveying direction into the conveyor track up to the contact with the surface of the subject-matter implements and after applying the label the manipulator a rectilinear return movement from the conveyor track becomes implements and
- b) applying a label in a labeling position located against the conveying direction a manipulator outside of the conveyor track with a label charged and the manipulator for applying the label on the subject-matter a pivotal movement in the conveyor track and one becomes the pivotal movement leading rectilinear movement implements, whereby the label is afterwards-driven to the subject-matter up to the contact with the surface by the manipulator and to applying the label the manipulator a back lagging from the conveyor track and one the back lagging hastening after rectilinear return movement implements.

In the comparison to the preceding explained embodiment in reverse order first a label becomes on a side located transverse to the conveying direction, D in this embodiment. h. Longitudinal side of the subject-matter applied and subsequent with the other Vorbeifördern of the subject-matter at the manipulator an other label on the side located against the conveying direction, D. h. those the conveying direction remote face of the subject-matter applied. Here the manipulator with the label for this planned drives to the subject-matter by-required at the manipulator by a pivotal movement and this pivotal movement the leading rectilinear movement into conveying direction afterwards and catches up the subject-matter, so that it comes to a contact with the surface of the subject-matter and applying the label in the desired manner.

Both preceding explained embodiments of the invention process can become single or also combined in two corresponding formed apparatuses applied, whereby becomes possible with a common application a labeling of the subject-matter on up to four sides located in various planes.

The movements of the manipulator with larger speed than the speed of the subject-matter performed required in conveying direction become favourable, so that a sufficient large time for taking up and applying the labels and/or reliable catching up of the subject-matter by-required at the manipulator are ensured.

In particular thereby possible becomes that the subject-matter despite applying the labels continuous, D. h. without interruption or deceleration at the manipulator by-conveyed will can, whereby a significant increase in output results in the case of the application of the labels opposite that so far prior art methods.

One particularly high flexibility and rapidity can become in accordance with a favourable development of the invention process by the fact achieved that the pivotal movement and the rectilinear movement of the manipulator and/or the back lagging and the rectilinear return movement of the manipulator independently performed become, which z. B. by separated drives and a corresponding controller for the pivotal movements and the linear movements of the manipulator realized will can. Preferably become here the pivotal movement and the linear

movement of the manipulator and/or the back lagging and the rectilinear return movement of the manipulator simultaneous performed, whereby when swinging the manipulator into the conveyor track and/or. when back swivelling the leading and/or. hastening after rectilinear movement of the manipulator superposed becomes and from this in the result one particularly rapid movement of the manipulator in the comparison the conveying speed of the subject-matter which can be labeled arises.

An other favourable embodiment of the invention process plans that the label is blown off by means of vacuum to the manipulator sucked and for applying on the subject-matter by means of overpressure by the manipulator. For this will for example proposed to use an actual known so called vacuum donation stamp as manipulator for the labels which is particularly suitable for applying single labels formed with a self adhesive layer in particular.

Applying of the label on the subject-matter can become here favourable by means of a contact sensor triggered formed at the manipulator, that with contact with the surface of the subject-matter blowing of the label off for example effected by means of overpressure applying on the subject-matter initiated.

Depending upon application and embodiment provided is to accomplish the movements of the manipulator either cyclic expiration-controlled which for example with subject-matters by-required successive in equal distances at the manipulator simple is feasible or which become movements of the manipulator in response of the position of the subject-matter on the conveyor track controlled, so that also in irregular distances at the manipulator by-required subject-matters reliable can be labeled.

For this proposed becomes that by means of a sensor a position of the subject-matter determined by-required required for reaching the labeling position on the conveyor track at the manipulator will and in response of this position of the subject-matter the rectilinear movement of the manipulator transverse to the conveying direction applying the label in the labeling position triggered located transverse to the conveying direction becomes.

An other sensor can for example an approaching of a subject-matter required on the conveyor track to the manipulator determine and in response of it the pivotal movement of the manipulator in the conveyor track and those the pivotal movement leading rectilinear movement of the manipulator for applying the label cause, over the label on one in and/or. to apply against the conveying direction located side of the subject-matter.

Furthermore other sensors provided can be, in order to guarantee the insurance of operation of the invention process, for example a sensor, the one position of the subject-matter by-required on the conveyor track at the manipulator within the swivelling range of the manipulator determined.

If a subject-matter is within the swivelling range, then swinging the manipulator out can be prevented into the conveyor track, in order to avoid damages of the same.

Also other sensors and/or logical linkages of the measurement results of the sensors are possible, in order to cause a controller of the movements of the manipulator dependent of the position of the subject-matter on the conveyor track, from which some still subsequent more near explained become.

The labels which can be applied on the subject-matter can be or become depending upon embodiment either prefabricated and already complete printed provided individual immediate before applying on the subject-matter by means of a suitable label printer with individual data printed.

In the scope of the invention suggested apparatus for applying labels on the surface of a subject-matter, whereby the labels are applicable on the subject-matter in two labeling positions located in various planes, moved by in a conveying direction along a conveyor track the apparatus, exhibits a dispenser to the delivery single labels and a manipulator for taking up, stops and applying of the labels delivered by the dispenser, whereby the manipulator is more swingable around a swivelling axis swingable supported and from an home position outside of the conveyor track around the swivelling axis into the conveyor track of the subject-matter.

The solution of the object initially placed proposed becomes in the scope of the invention that the manipulator of the pivotal movement is hastening after against the driving out direction retractable in swinging out direction leading in a driving out direction extensible and the subsequent back lagging against the swinging out direction.

Embodiment invention plans here that a pivotal arm swingable around the swivelling axis is provided, by means of whose the manipulator is more swingable into the conveyor track of the subject-matter and which is a manipulator in the area of the free end of the pivotal arm transverse to longitudinal axis of the same rectilinear movable disposed, such that the manipulator transverse to longitudinal axis of the pivotal arm in a driving out direction the extensible and the subsequent leading from an home position at the pivotal arm of the pivotal movement in swinging out direction back lagging against the swinging out direction are hastening after against the driving out direction retractable.

Of course also different embodiments, which make a swinging possible of the manipulator out into the conveyor path of the subject-matter, are more conceivable in the scope of the invention.

By this formation of the apparatus according to invention a labeling position of the manipulator can become by swivelling of the pivotal arm and thus the manipulator supported to it from an home position in swinging out direction and extension of the manipulator from its home position at the pivotal arm in driving out direction achieved. Here the manipulator hurries ahead with the extension of the pivotal movement. In this labeling position a label on a face of the subject-matter, received on the manipulator, can become applied.

In an embodiment of the invention the swinging out direction and the driving out direction of the manipulator are directed against the conveying direction of the subject-matter which can be labeled. The manipulator is against-driven to the subject-matter moved in conveying direction when starting this labeling position, so that a labeling of the face of the same located in conveying direction of the subject-matter is causable.

In another embodiment of the invention the swinging out direction and the driving out direction of the manipulator in conveying direction of the subject-matter which can be labeled are directed. The manipulator is afterwards-driven when starting this labeling position into conveying direction of moved subject-matter and achieved these due to a higher overall speed from swinging out and departure speed opposite the conveying speed of the subject-matter. On this type a labeling of the face of the subject-matter located against the conveying direction is possible.

An other labeling position of the manipulator can become by extension the same from its home position at the pivotal arm in driving out direction transverse to the conveying direction of the subject-matter achieved, whereby the pivotal arm in its unverschwenkten home position remains. This labeling position is for applying a label on an essentially parallel longitudinal side of the same suitable located to the traveling direction of the subject-matter, which borders on the front surface in accordance with the first mentioned labeling position.

In a favourable development of the invention proposed that a controller for the movements of the manipulator is provided, becomes in such a manner that successively the labeling position suitable for the application of a label on the face and the labeling position suitable for applying a label on the longitudinal side of the subject-matter are more achievable.

Since the labeling position of the manipulator suitable for applying a Etikettes on the face located in conveying direction of the subject-matter becomes achieved by swivelling of the pivotal arm with the manipulator from its home position and the pivotal movement a leading extension of the manipulator from its home position at the pivotal arm against the conveying direction of the subject-matter, labeling of this face of the subject-matter can become forced around the measure of the extension of the manipulator against the conveying direction of the subject-matter. Thereby a sufficient time for the subsequent back lagging and hastening after rectilinear return movement of the manipulator in opposite direction becomes recovered, so that the second label can become intermediate received on the manipulator, while the subject-matter at the labeling device becomes continuous by-conveyed. Subsequent one can be provided by visiting the second labeling position also the longitudinal side of the subject-matter with a label by rectilinear extension of the manipulator transverse to the conveying direction of the subject-matter.

Also it is possible to apply first by extension of the manipulator transverse to the conveying direction of the subject-matter with pivotal arm remaining in the original position a label on the longitudinal side one at the labeling device of moved by subject-matter and to move the subsequent manipulator backward in opposite direction. After receptacle of an other label then the labeling position can be started for swung out and driven out manipulator leading in this direction also in conveying direction, since intermediate the subject-matter around a sufficient large path other-conveyed is. As soon as the manipulator caught up the by-required subject-matter and with its against the conveying direction located face into contact comes, the label becomes applied.



In order to prevent a reduction of the speed of the subject-matter which can be labeled or stoppings the same between applying first and a subsequent second label, the movement of the manipulator is into for labeling a face of the subject-matter suitable the labeling position and/or from this labeling position back into the home position with larger speed than the conveying speed of the subject-matter which can be labeled feasible.

The invention teaches that with this embodiment of the apparatus stoppings subject-matter of the moved by the apparatus for labeling surfaces, which lie in two various planes no longer necessary is. Thereby a significant increase of the efficiency of the apparatus according to invention becomes achieved.

The dispenser for the single labels in such a manner disposed is favourable that with in the home position located pivotal arm and in its home position at the pivotal arm located manipulator is abgebbbar a label of the label delivery mechanism to the manipulator. Thereby the receptacle of labels before visiting a first labeling position and before visiting an other labeling position becomes problem-free possible.

The pivotal movement and the method of the manipulator are favourably independently causable, which z. B. by independent drives for the pivotal arm and to it movable supported manipulator the realized will can. So z can. B. the pivotal arm by means of a rotary drive and the manipulator by means of a linear drive driven become. Both drives are preferably formed as pneumatic cylinders.

The pivotal movement and the method of the manipulator are causable in accordance with a favourable development of the invention in a common plane. Here the manipulator can be either around a vertical longitudinal swivelling axis or around an horizontal longitudinal swivelling axis swingable formed. In case of a vertical longitudinal swivelling axis will labeling the face and a longitudinal side of the subject-matter possible, in case of an horizontal swivelling axis becomes labeling a face and the upper and/or. Underside of the subject-matter possible.

In order to increase and accomplish the movement of the manipulator in and/or from the labeling position for labeling a face of the subject-matter rapid as the moving speed of the subject-matter which can be labeled the efficiency of the apparatus according to invention more other, are causable the pivotal movement and the method of the manipulator and/or the back lagging and return movement of the manipulator simultaneous, which z. B. by corresponding independent control of the drives for the pivotal movement of the manipulator causative pivotal arm and the procedure movement of the manipulator is causable. In particular it is thereby also possible to provide alternatively only one or both surfaces of the subject-matter which can be labeled coming into question with a label to which the pivotal movement and the method of the manipulator become corresponding controlled.

In accordance with an embodiment of the invention the manipulator can exhibit a vacuum donation stamp, which is subjectable for taking up and holding a label with vacuum, so that the

preferably self adhesive formed label at this sucked becomes and is subjectable applying the label with overpressure, so that the label is blown off in the direction of the surface which can be labeled. By this formation of the manipulator contactless applying of the labels becomes possible on the desired surface of the subject-matter, which with very sensitive subject-matters of advantage is, as also an attachment on uneven surfaces is problem-free possible.

The manipulator can favourably exhibit a contact sensor, which is bringable in labeling position of the manipulator with the surface of the subject-matter which can be labeled in contact in accordance with an other embodiment of the invention. By this contact sensor applying the label suitable distance of the manipulator can become the respective surface of the subject-matter determined and become then contact-control applying, for example blowing the label off of the manipulator effected.

Further favourably at least a sensor can be for determining a position of the subject-matter regarding the apparatus according to invention provided to arrange for example in order with subject-matter a moved by the apparatus starting the second labeling position suitable for the delivery of a label on a longitudinal side of the subject-matter. Also it is possible to supervise by means of other sensors whether the swivelling range of the pivotal arm is free, or a subject-matter within the swivelling range is. By means of sensors beyond that alternatively also visiting of the labeling position for labeling the face of a subject-matter is releasable, if the subject-matter which can be labeled becomes near-conveyed to the labeling device. By a such sensor the delivery of a label can become to the manipulator and visiting the corresponding labeling position if necessary (on that and) started, if no automatic, z. B. cyclic repetition of the labeling procedures desired becomes. In the practice this option in the cases can become used, in which between the labeling procedures successive required subject-matters longer periods lie. Here is not the manipulator unnecessary prolonged with a received and a z. B. sucked label for the next subject-matter which can be labeled wait, since here an unnecessary high consumption of air and also a change of the adhesive characteristics would be to be taken with self adhesive labels in purchase.

The flexibility of the apparatus according to invention can become thereby increased beyond that that the dispenser for the labels of a label printer is formed, the current determined data, z. B. Weight, scanned bar code data for each label individual also into the design of the same to merge knows and the subsequent manipulator with the label charged.

The apparatus according to invention favourably exhibits an inertial rack, is höhenverstellbar supported by means of whose at least the manipulator. Preferably one becomes all according to invention höhenverstellbar at the inertial rack holding simultaneous to the delivery, receptacle and application of the labels of required parts of the apparatus, so that the exact alignment of these parts remains to each other also during a vertical adjustment obtained.

In this way the apparatus according to invention can become rapid and simple to varying sizes of subject-matters which can be labeled adapted. The pack frame can be provided with detectable rollers also.

The invention becomes subsequent more near explained on the basis embodiments in the drawing. Show:

Fig. 1a the side view of a labeling device according to invention,

Fig. 1b the supervision on the labeling device in accordance with Fig. 1a,

Fig. 2a the side view of the labeling device in a labeling position,

Fig. 2b the supervision on the labeling device in accordance with Fig. 2a,

Fig. 3-6 the supervision on the labeling device in accordance with Fig. 2b in various phases of the labeling procedure,

Fig. 7 the supervision on a development of the labeling device according to invention,

Fig. 8 the supervision on an other embodiment of the invention,

Fig. 9 the supervision on an other embodiment of the invention,

Fig. 10 in perspective view one palette which can be labeled.

In the Fig. 10 is exemplarily a labeling subject-matter, here a palette 2 also on it located package 2a shown. For product marking it is for example desirably, per a label 170, 171 on ever sides 20 located in various planes to apply 21.

One in addition suitable device 1 is in the Fig. 1a and 1b shown, which are lateral at a conveyor path in shape of a conveyor belt 3 for the subject-matters established which can be labeled. The apparatus 1 covers a dispenser for labels into shape of a label printer 17 also labels rolled up on a label role of 17a as well as a manipulator 16 with a vacuum donation stamp 161, which is subjectable for taking up and holding a label with vacuum and for applying the label with overpressure, which subsequent still more near explained becomes.

In the illustrated embodiment of possible printers 17 a printing on of labels with individual informations, used as dispenser. It is of course also possible to use labels already preprinted. In this case only the other functions of the printer 17, like stepping motor-controlled label feed motion, become the sensor technology the label gap scanning, the donation edge the peeling of the label of the carrier tape etc. used, in order to deliver the labels already preprinted, while the printer controller receives only no more printing data, but only the data, which are required for

the delivery of the labels. These data contain and. A. Indications over the output rate and/or the size of the labels. If exclusive preprinted labels used can become to become to be supposed, in place of a printer 17 naturally also a simple constructed suitable dispenser for the labels the vacuum donation stamp 161 of the manipulator 16 provided.

The label printer 17, which is manipulator 16 still subsequent other with vacuum donation stamp 161 and to explanatory components the apparatus 1 to each other aligned in an inertial rack supported, which is upward from in u-shaped stand frameworks 10 to setting up on a ground as well as a vertical support column extending from this stand framework 10 11 with an attachment handle 12 for the support of the other components of the labeling device 1 formed.

The manipulator 16 covers an other pivotal arm 13, which is more swingable around a vertical swivelling axis T, whereby the manipulator 16 at the free end 130 of the pivotal arm is 13 supported. The pivotal arm 13 is over rotary bearings 140 rotatable 12 and formed rotatable connected with the attachment handle around the here vertical longitudinal swivelling axis T over a for example pneumatic rotary cylinder 14, so that by means of the pivotal arm 13 a pivotal movement of the manipulator is causable 16 around the swivelling axis T.

From the Fig. 1b is to be taken beyond that the fact that the vacuum donation stamp 161 of the manipulator is 16 not immediate in the area of the free end 130 of the pivotal arm 13 at this fixed but at transverse to the longitudinal extent an X of the pivotal arm 13 X rectilinear in and extensible preferably pneumatic linear cylinder 15 fixed is extending and transverse to the longitudinal extent.

To the controller of all functions of the apparatus 1 is a control unit provided, which is in a corresponding housing 18 in manner not represented more near accommodated here.

At the support column 11 means provided are, in order to adjust the attachment handle 12 with the parts of the apparatus, i.e. label printer 17, fixed to it, manipulator of 16 with vacuum donation stamps 161 and pivotal arm 13 with rotary cylinder 14 and rotary bearing 140 in direction of arrow H in the height over the stand framework 10 in manner not represented more near. In this way the manipulator can do 16 simple on for labeling a subject-matter of predetermined size suitable height in accordance with Fig. 10 set and with changes of the subject-matters switched become, without the exact alignment of all parts of the apparatus becomes affected to each other.

Into the Fig. 1a and 1b is the pivotal arm 13 with the manipulator 16 in its unverschwenkten output days A, how also the linear cylinder 15 at the free end 130 of the pivotal arm is 13 in its pushed in original position M positioned, in which the manipulator 16 with its vacuum donation stamp 161 the close longitudinal axis X of the pivotal arm 13 disposed is. In this original position it is the vacuum donation stamp 161 of the manipulator 16 possible, from the label printer 17 finished and in Fig. to take up 1a upward in accordance with arrow E delivered label 170. For this the vacuum donation stamp becomes 161 applied with vacuum, in whose sequence the label delivered by the label printer 17 will angesogen on the vacuum donation stamp 161, in the

manner that one is usually with self adhesive labels single present adhesive layer vacuum donation the stamp 161 remote.

After in the preceding explained manner of vacuum donation the stamp 161 of the manipulator 16 a label 170 received is, subject-matter a moved by the labeling device 1 can be provided with this label. For this purpose a first labeling position E1 is more achievable, those in the Fig with the labeling device 1. 2a and 2b shown are.

Like this Fig. 2a and 2b is more removable, becomes the first labeling position E1 by the fact achieved that the pivotal arm 13 with the manipulator 16 from its unverschwenkten starting position A in accordance with Fig. 1b in swinging out direction S1 by confirmation of the rotary cylinder 14 around here 90 DEG pivoted becomes, so that the manipulator 16 into the conveyor path, D, fixed at the pivotal arm 13. h. over the promotion of the subject-matters which can be labeled serving conveyor belt 3 pivoted becomes. Simultaneous one becomes in the area of the free end 130 of the pivotal arm 13 disposed and transverse to the longitudinal extent X of the pivotal arm 13 out and/or. retractable pneumatic linear cylinders out 15 driven from its brought in original position M close of the pivotal arm 13 into its maximum extended position in driving out direction L1 rectilinear, whereby the manipulator 16 with its vacuum donation stamp 161 will proceed and the label 170 transverse to the longitudinal extent X of the pivotal arm 13 supported to it, into a maximum distance of the longitudinal axis X of the pivotal arm 13. The movement of the pivotal arm 13 with manipulator 16 in swinging out direction S1 and the extension of the linear cylinder 15 with the manipulator 16 in driving out direction L1 take place thereby in a same plane, whereby the rectilinear extension of the manipulator 16 of the pivotal movement hurries ahead and continues these tangential.

In the Fig. 2b represented labeling position E1 can expect the apparatus 1 now approaching one subject-matter on the conveyor belt 3 or such a thing, which can be labeled. The conveyor belt 3 is here so disposed that it can by-promote a subject-matter in actual known manner at the labeling device 1, whereby the pivotal arm 13 with the manipulator fixed to it 16 projects with manipulator 16 located in labeling position E1 in rectangular into the conveyor path of the conveyor track 3, and which linear cylinder drove 15 16 to the conveying direction F out that opposite with the manipulator conveyor belt 3, D. h. the manipulator 16 a subject-matter required in conveying direction F is against-driven.

In addition both the swinging out direction S1 is as well as the driving out direction L1 of the conveying direction F of the subject-matter against-directed.

In the Fig. 3 is shown, as a subject-matter becomes, for example the here only schematic suggested palette 2 in conveying direction F of the conveyor belt 3 to the vacuum donation stamp 161 of the manipulator 16 near-conveyed located in labeling position E1. The palette 2 is to be provided here by means of the apparatus 1 both on their face 20 as well as on the adjacent, adjacent longitudinal side 21 pointing in conveying direction F with one label each.

Thus with one itself z. B. due to a disturbance still in the swivelling range of the pivotal arm 13 located palette 2 no collision and damage of the same to arise, is the apparatus 1 in conveying

direction F knows pre-aged a sensor 19,2, about a light barrier disposed, by means of those before swinging the pivotal arm 13 in swinging out direction S1 out examinably is whether the swivelling range is free or is blocked by a palette 2, so that can become prevented in this case the pivotal movement.

After the labeling position E1 achieved is, besides checked can become by means of the sensor 19,2 within a predeterminable time whether the actual palette expected of the manipulator 16 becomes 2 near-conveyed. If the sensor does not emit 19,2 within the predefinable time an appropriate signal, this points on a promotion disturbance, which can become corresponding 18 signaled of the controller.

The palette 2 approaching in conveying direction F meets face 20 which can be labeled with their first the manipulator 16 with vacuum donation stamp 161 located in its first labeling position E1 and the label 170 supported to it. To the controller of applying the labels the vacuum donation stamp 161 exhibits a contact sensor 160 foregoing in the direction of the palette 2, which emits an appropriate signal with contact with a surface, here the face 20 of the palette 2 located in conveying direction F, in whose sequence the application of the vacuum donation stamp 161 with vacuum holding the label 170 waived and instead of its vacuum donation stamp 161 with overpressure applied becomes, so that the label is blown off in the direction of the face 20 of the palette 2 against their conveying direction F and with its self adhesive side adheres there. There the label 170, z. B. by means of compressed air by the vacuum donation stamp 161 and in the free flight on the surface of the palette 2 which can be labeled hits, is this type of the application is blown off to an insensitive opposite uneven surfaces and prevented on the other hand a damage possibly. sensitive good ones on the palette 2.

Simultaneous one with the blowing of the label 170 of the vacuum donation stamp, controlled by means of contact sensor 160, 161 off sets a back lagging of the pivotal arm 13 with the manipulator 16 in direction of arrow S2, D. h. against the swinging out direction S1 and a rectilinear return movement of the linear cylinder 15 in direction of arrow L2, D. h. against the driving out direction L1, around in the Fig. 1a and 1b characterized original positions A to visit M the same again. Therefore the manipulator 16 is tilted back from the conveyor path of the conveyor track and moved backward simultaneous more linear, whereby the linear return movement hastens after L2 of the back lagging S2. Here the labeling device wins by when visiting the labeling position E1 in accordance with Fig. 2 made extension of the linear cylinder 15 on its maximum length against the conveying direction F of the palette 2 an advance in the length of the maximum drive out-prolonged of the linear cylinder 15, which can be labeled, which with numeral R in Fig. 3 characterized is. In order this length R will thus the labeling procedure on the face 20 of the palette opposite the pivotal arm 13 of the labeling device 1 forced, in order to guarantee sufficient time for a subsequent delivery of an other label for labeling the longitudinal side 21 of the palette.

Thereby possible becomes that the palette 2 neither for applying the label 170 on the face 20 in in the Fig. 3 represented manner a deceleration and/or. Interruption of their movement in direction of arrow F, still the subsequent return movement of the pivotal arm 13 in accordance with arrow S2 and the linear cylinder 15 in accordance with arrows L2 such an interruption and/or. Deceleration of the movement in direction of arrow F of the palette 2 conditional.

Rather can, as in the Fig. 4 shown, the palette 2 their movement in accordance with arrow F at the conveyor belt 3 during the back lagging of the pivotal arm 13 and the return movement of the linear cylinder 15 unobstructed and uninfluenced continue, since this return movement is more rapid feasible substantial, than the palette becomes 2 in direction of arrow F conveyed. Usually such palettes become 2 on conveyor belts 3 in a speed of for example 10 to 15 m/min conveyed, so that sufficient time for the back lagging of the pivotal arm 13 and the return movement of the linear cylinder 15 into the original positions A, M remains.

An other time gained with the return movement of the pivotal arm 13 and linear cylinder 15 becomes that by means of the controller 18 an independent and a simultaneous, achieved by the fact, D. h. simultaneous taking place back lagging of the pivotal arm 13 and return movement of the linear cylinder 15 and the manipulator 16 supported to it is causable, which with the combined superposed arrow S2, L2 in the Fig. 4 shown is. The addition of both cylinder speeds with simultaneous return movement of pivotal arm 13 and linear cylinder 15 results in a total return movement of the manipulator 16, which is rapid as the conveying speed of the palette 2 in direction of arrow F.

During the unobstructed other promotion and movement of the palette 2 in direction of arrow, taking place now, F on the conveyor belt 3 the manipulator 16 becomes again into its covering position with in original position A located pivotal arm 13 and in the brought in state, D. h. likewise in the original position M located linear cylinder 15 moves backward.

The Fig. 5 it is more removable that thus with other promoting of the palette past the manipulator 16 on its vacuum donation stamp 161 an other label 171 from the label printer 17 intended for labeling the longitudinal side 21 of the palette 2 can receive and take up 2 to direction of arrow F at the labeling device 1. By the return movement of the pivotal arm 13 and the linear cylinder 15 taking place with high speed here sufficient time remains, in order to print a new label and to deliver to the manipulator 16 on its vacuum donation stamps 161, which becomes now again applied with vacuum, for the label printer 17.

With other promotion 3 in direction of arrow F this palette 2 arrives to the palette 2 on the conveyor belt into a pre-setable position immediate before the labeling device 1, which can become by the conveyor belt 3 supervising sensor 19,1, for example a light barrier determined. As soon as the palette 2 starts the sensor 19,1 passed, the apparatus 1 its second labeling position E2 for the manipulator 16, with the pivotal arm 13 in its original position A remained, however the linear cylinder 15 with the manipulator 16 in driving out direction is so far driven out L3 transverse to the conveying direction F, until the contact sensor 160 at vacuum donation the stamp 161 of the manipulator 16 with the longitudinal side 21 of the palette 2 which can be labeled comes into contact and for blowing the label 171 off by means of overpressure on the longitudinal side 21 of the palette 2 emits the signal. If within a predeterminable waiting time no signal from sensor the 19,1 discharged becomes, a failure report can become discharged, so that a promotion disturbance rapid recognized can be repaired and.

The position of the label 171 on the longitudinal side 21 can become by a displacement of the sensor 19,1 in direction of arrow Y simple varied.

Now the palette 2 without interruption of their promotion in direction of arrow F on the conveyor belt 3 with a label 170 on the face 20 and with a label 171 on the adjacent longitudinal side 21 was provided by the movements of the manipulator 16. The linear cylinder 15 with the manipulator 16 needs to only go back now against the driving out direction in direction of arrow L30, referred with L3, into its original position M and the manipulator 16 can a new label 170 for the next near-promote palette 2 on the conveyor belt 3 to receive and is now again in to the Fig. 1a and 1b represented original position.

With the preceding explained apparatus 1 is from therefore a multiple labeling of a subject-matter, here a palette 2, in two labeling positions on the surface of the subject-matter possible, located in various planes. Of course it is however also possible to only provide with the apparatus 1 a side, for example the face 20 or also only the longitudinal side 21 of the palette 2 with a corresponding label 170, 171 whereby no change work on the apparatus is required.

The preceding explained invention possible thus labeling of or two together adjacent sides of a subject-matter, z. B. a pallet surface or a cardboard box. The identification of these sides here one single label each can become applied, whereby problem-free also large labels, for example in the format DIN-A-5 or large in the upright format applied to become to be able. Without a over hitting a corner labeling with a double label can be done therefore with the apparatus 1, so that also no high claims to the edge training of the subject-matter provided to become to have. Furthermore the possibility exists to print the labels on which can be applied by means of the label printer only more immediate before applying around current determined data, z. B. Weight to be able to bind scanned bar code data for each for label individual.

Labeling knows here both on smooth as well as irregular shaped surfaces, like it z. B. on palettes of stacked bag commodity arise, made become, whereby practice-conventional defaults and tolerances, z. B. to pertinent CCG defaults for label positioning, like the minimum clearance X of a label of a pallet edge of at least 50 millimeters, see Fig. 10, to be kept can.

The preceding explained apparatus possible of therefore applying labels on pre-determined together adjacent surfaces of at this moved by subject-matters, like palettes 2, those on the conveyor belt 3 with high frequency, z. B. a palette/a min. the labeling device 1 in direction of arrow F to be moved by. In such a case visiting the labeling position E1 of the manipulator can take place for labeling the face of the palette favourably clock-controlled pointing in conveying direction F, whereby the labeling device 1 here very high cycle times possible.

Using one to the apparatus 1 in conveying direction F other pre-aged sensor 19,3, see Fig. 7, which is for example likewise formed as light barrier, also an operation of the apparatus on retrieval (on that and) can become effected. This is in particular with with smaller frequency at the apparatus 1 by means of the conveyor belt 3 led past to labeling palettes 2 of advantage. For this the pressure becomes applying on the face 20 certain labels 170 triggered pointing in conveying direction F of the palette 2 with approaching a palette 2 in conveying direction F on the conveyor belt 3 first over the sensor 19,3, which subsequent in the already described manner and into the labeling position E1 transported received of the manipulator 16 becomes. The



subsequent taking place flow for applying this label 170 and subsequent applying of an other label 171 on the longitudinal side 21 corresponds then again to that preceding explained embodiment.

If 1 by-conveyed in regular intervals palettes 2 of the conveyor become 3 at the apparatus, the sensor is not 19,3 required. In this case visiting the labeling position E1 can be visited for labeling the face 20 of a palette 2 located in conveying direction whenever the two remaining sensors 19,1 and 19,2 simultaneous no signal under one at the sensors 19,1 and/or. 19,2 located palette 2 deliver.

The apparatus according to invention possible here palettes large for labeling, which become conveyed on a conveyor belt with a typical speed of 10-15 m/min, a performance of up to 7 reciprocal labeling, D. h. altogether 14 labels for each minute.

Beside these economic advantages the apparatus 1 exhibits also an high reliability. If it should come during the operation of the apparatus 1 to disturbances in the movement of the pivotal arm 13 or linear cylinder 15, it comes with toward the labeling position E1 pivoted pivotal arm 13 and/or linear cylinder 15 and. And. to a collision with the palette 2 moved on the conveyor belt 3 in direction of arrow F. Here however damages are missing, since the palette 2 the pivotal arm 13 and the linear cylinder 15 only into the direction, required in direction of arrow F, along-moved, anyway moved into which they became when back moving after applying a label in the labeling position E1, so that damages of the palette and/or the apparatus 1 are not to be feared 2.

In the preceding explained embodiments the apparatus is 1 regarding the conveyor belt 3 always so shown that in the supervision from above the pivotal arm is swing-out 13 against the clockwise direction in swinging out direction S1 to visit about in order the labeling position E1. It is of course in the scope of the invention also possible to plan one mirror-image to the conveyor belt 3 constructed apparatus 1 with which the pivotal arm is swing-out 13 in the clockwise direction in swinging out direction S1.

An other possible embodiment of the apparatus 1 is in the Fig. 8 shown.

In the Fig. again transverse to longitudinal axis of the pivotal arm 13 in driving out direction L1 extensible manipulator 16 exhibits 8 illustrated apparatus 1. The driving out direction L1 of the manipulator 16 and the swinging out direction S1 of its pivotal arm 13 is here however in such a manner aligned that they point in conveying direction F of the palettes 2 which can be labeled, while 2 directed with the preceding explained apparatuses this driving out direction L1 and the swinging out direction S1 is against the conveying direction F of the palettes. When approaching a palette 2, those in the Fig. 8 first only dashed shown is, made by means of the apparatus 1 first visiting the labeling position E2, with which the pivotal arm 13 in its home position A remains and for which manipulator 16 in driving out direction L3 is driven out. Here he comes with into the Fig. and a corresponding before received label can attach 8 of dashed illustrated position of the palette 2 with the longitudinal side 23 of the palette 2 in contact there. After the subsequent back moving of the manipulator 16 the palette 2 with continuous promotion in direction of arrow

F arrives into their with solid lines illustrated position, in which the pivotal arm 13 with the manipulator 16 in swinging out direction S1 and conveying direction F of the palette 2 is swung out. In addition the manipulator 16 is driven out in driving out direction L1 and conveying direction F, until the labeling position is E1 achieved, with which the manipulator 16 catches up the required palette and on the face 22 located against the conveying direction F of the palette 2 is there put onable and likewise a label can attach 22 on this face.

Both preceding explained embodiments of the invention, D. h. both the embodiment in accordance with the Fig. 1 to 7, with that the manipulator for reaching the labeling position E1 the subject-matter required in conveying direction F against-drives like also the embodiment in accordance with Fig. 8, with that the manipulator for reaching the labeling position E1 the subject-matter required in conveying direction F afterwards-driven into conveying direction, makes alternatively the application possible of a label on the face or a label on the longitudinal side of the subject-matter, how also labeling is both the face and the longitudinal side of the subject-matter possible with the continuous Vorbeifördern at the apparatus.

Beyond that it in addition, possible are to combine the two preceding explained embodiments from apparatuses to in order to make a labeling possible of all four sides of the subject-matter, what in the Fig. 9 shown is.

From these Fig. 9 is apparent that again the subject-matters, here palettes 2, which can be labeled, become in a conveying direction F on a conveyed continuous of a conveyor belt 3 formed conveyor track. In the representation in accordance with Fig. 9 on the right of the conveyor belt 3 with 1.2 characterized apparatus, those is in accordance with in the Fig. 1 to 7 explained embodiment constructed is, D. h. with that the manipulator 16,2 for visiting its labeling position E1.2 of the palette 2 required in conveying direction F against-drives. In the representation in accordance with Fig. 9 on the left of the conveyor belt 3 an other apparatus characterized with 1.1, the analogue is to in the Fig in conveying direction F considered easy pre-aged opposite the apparatus 1,2. 8 explained embodiment constructed is, D. h. with that the manipulator 16,1 for reaching the labeling position 1,1 of the palette 2 required in conveying direction F afterwards-drives.

The two apparatuses 1,1 and 1,2 are such a lateral conveyor belt 3 disposed that first when approaching a palette 2 in their strichierte illustrated position the labeling device 1,1 by extension of the manipulator 16,1 in direction of arrow L3 a label in the labeling position E2.1 on the longitudinal side 23 of the palette 2 applies and the simultaneous labeling device a label applies 1,2 in already explained manner in the labeling position E1.2 on the face 20 of the palette 2. Subsequent ones become both manipulators 16,1 and/or. 16,2 of the apparatuses 1,1 and/or. 1,2 in its respective home position moved backward and/or tilted back and the palette 2 becomes without interruption of its promotion movement in direction of arrow F into their with solid lines in the Fig. 9 illustrated position other-conveyed, with which it is provided already with a label on its longitudinal side 23 and the face 20 pointing in conveying direction F.

As soon as the palette 2 their in the Fig. 9 with solid lines illustrated position achieved, the manipulator 16,1 of the apparatus 1,1 by rear spar-skilled in conveying direction F becomes into its labeling position E1.1 moved, in which it applies a label on the face pointing against the

conveying direction F of the palette 2 22 the same. Simultaneous one becomes a manipulator 16,2 of the apparatus 1,2 into its labeling position E2.2 moved and applies a label in already explained manner on the longitudinal side 21 of the palette 2. Also here no interruption of the movement of the palette is 2 in conveying direction F necessary and in the result the palette 2 at all four sides 20, 21, 22, 23 with one label each was thus provided.

It therefore is from obvious that with an arrangement of two apparatuses 1,1, 1,2 in accordance with Fig. 8 all four sides 20, 21, 22, 23 of a palette 2 with one label each without interruption of the promotion in direction of arrow F to be provided can. Of course it is to be provided also possible labeling positions E1.1, E1.2, E2.1, E2.2 also only selected sides 20, 21, 22, 23 of the palette 2 only selected by starting in each case with a label.

Also in this embodiment the possible apparatus 1,1 applying ever a label on two adjacent together adjacent sides of the palette 2 without interruption of the promotion in direction of arrow F, like it also during the labeling device 1,2 and/or. 1 the case is. Only with very high conveying speeds it can become necessary if necessary to stop or slow the palette down 2 in their with solid lines illustrated position for a short period in their movement in conveying direction F, in order to make an applying possible of a label on the face 22 of the palette 2 located against the conveying direction F.

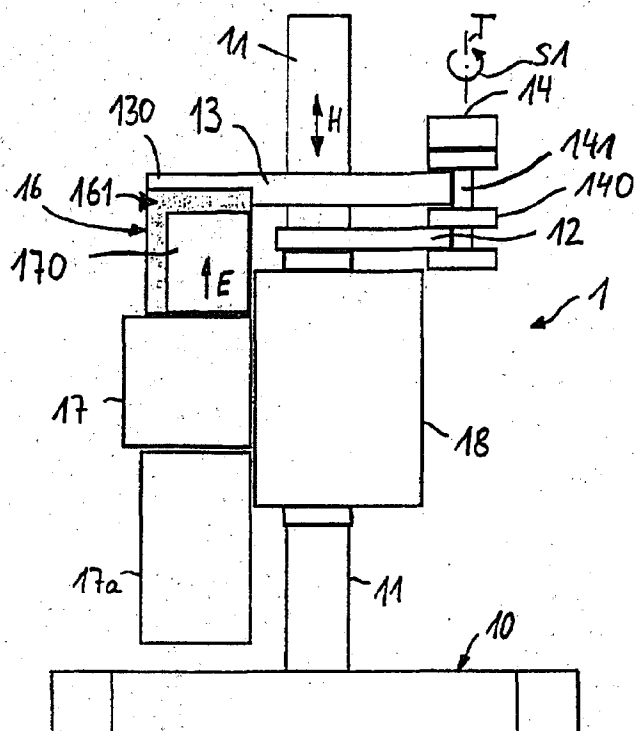


Fig. 1a

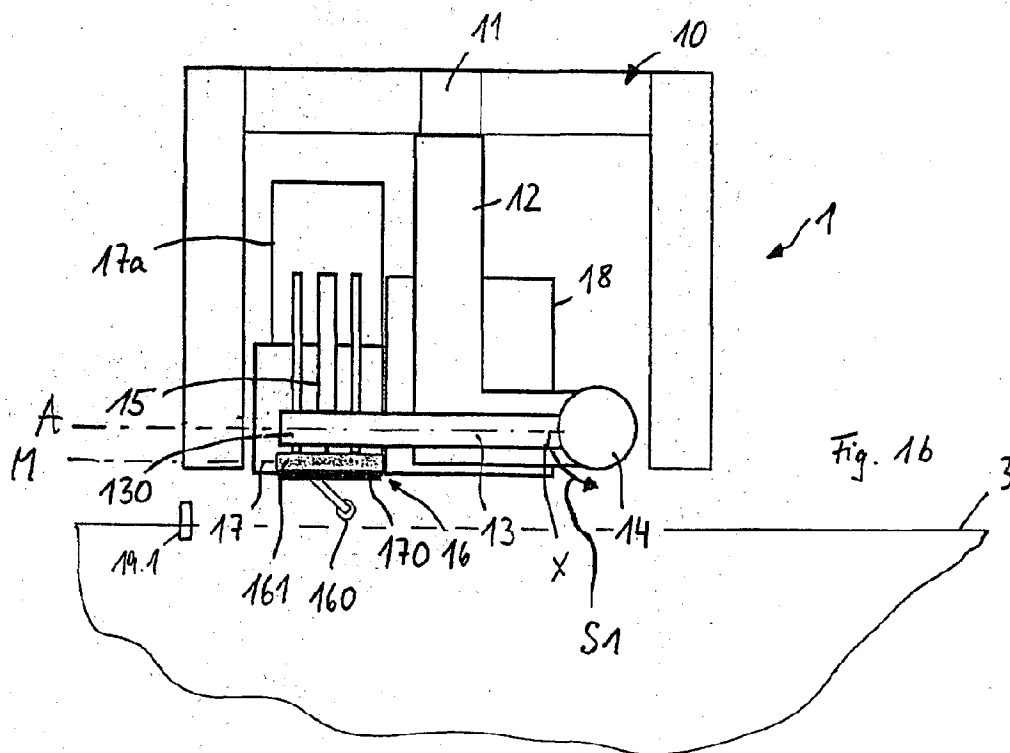
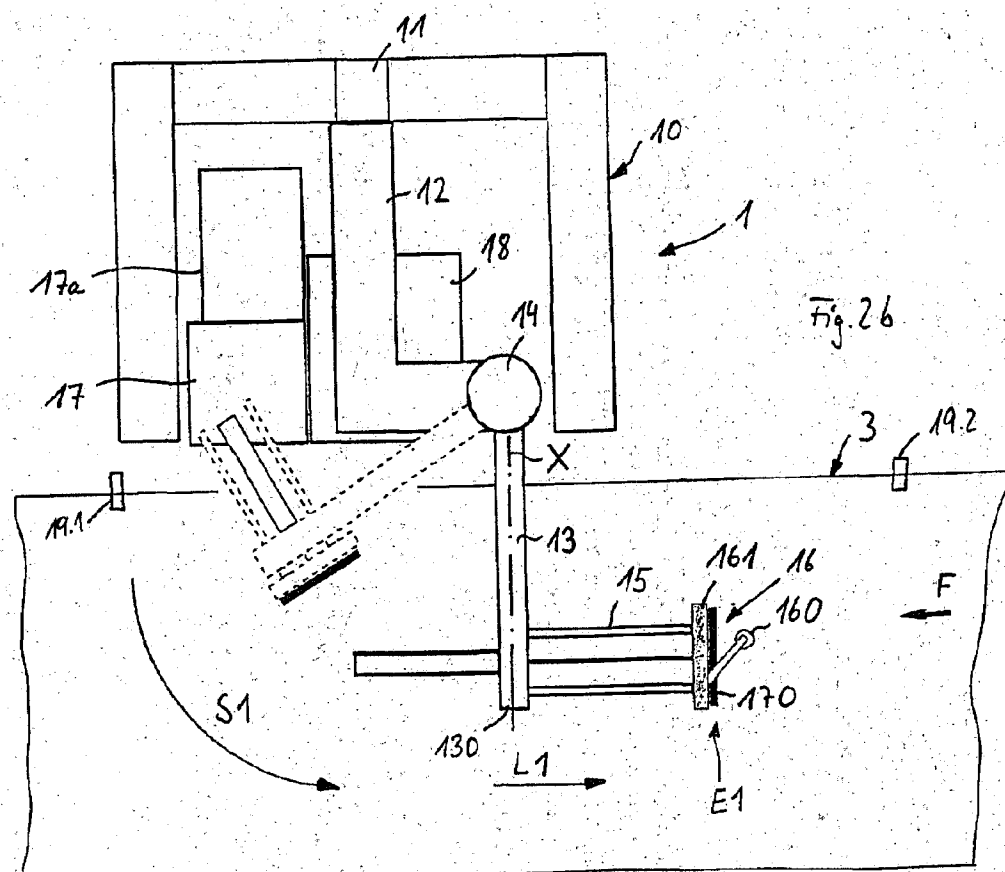
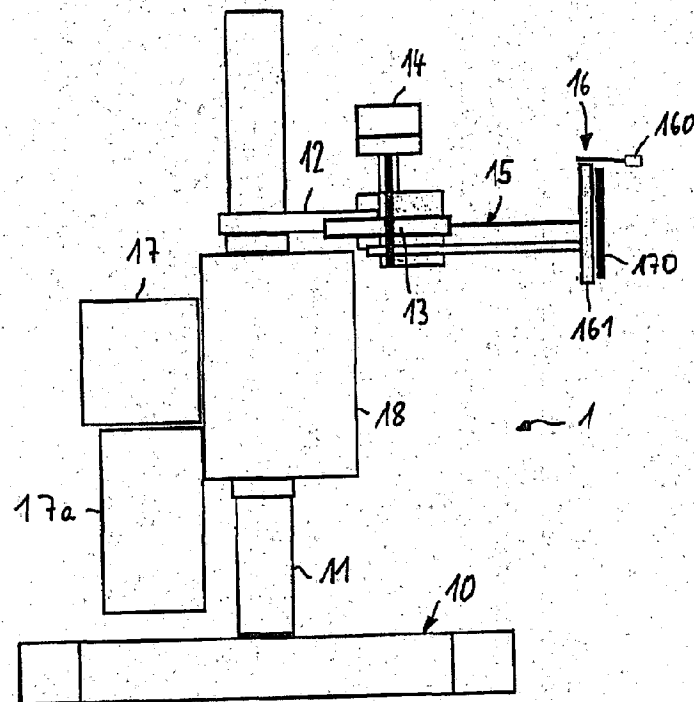


Fig. 1b



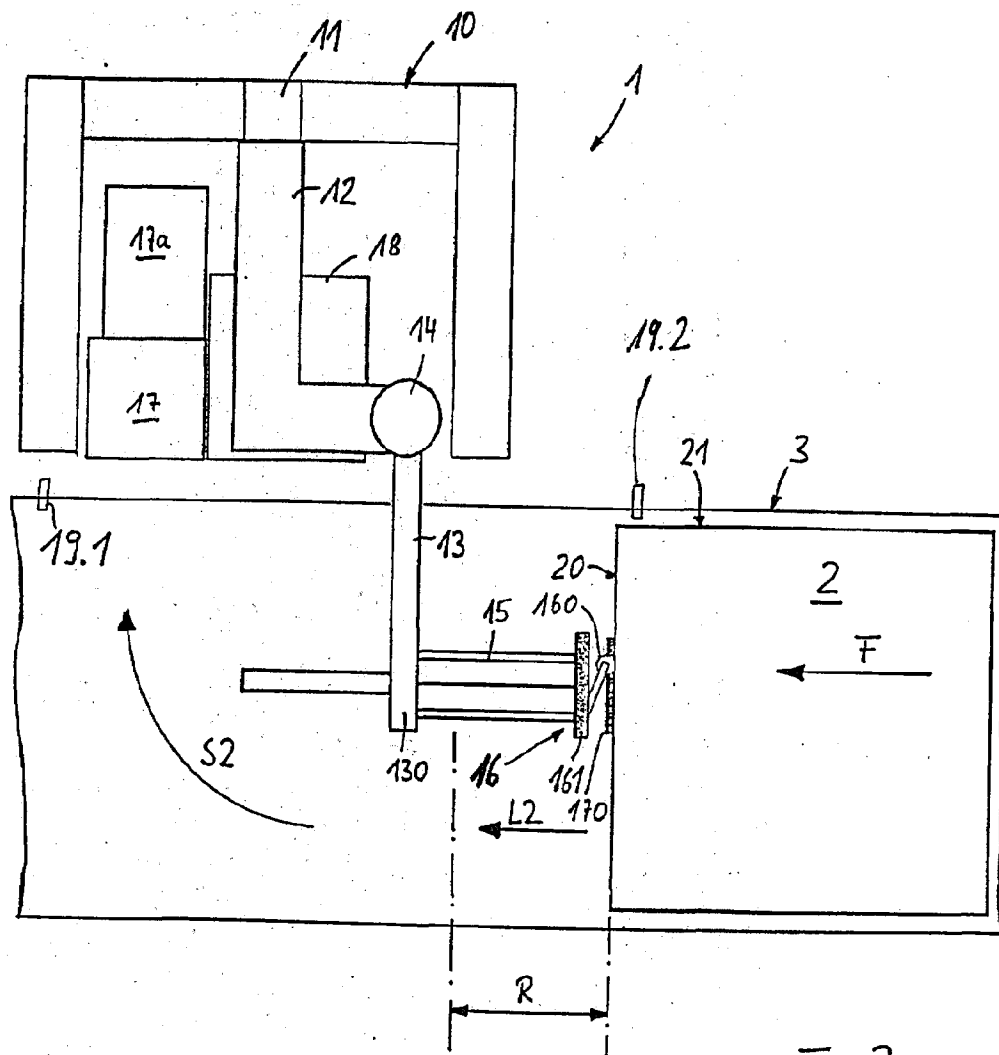


Fig. 3

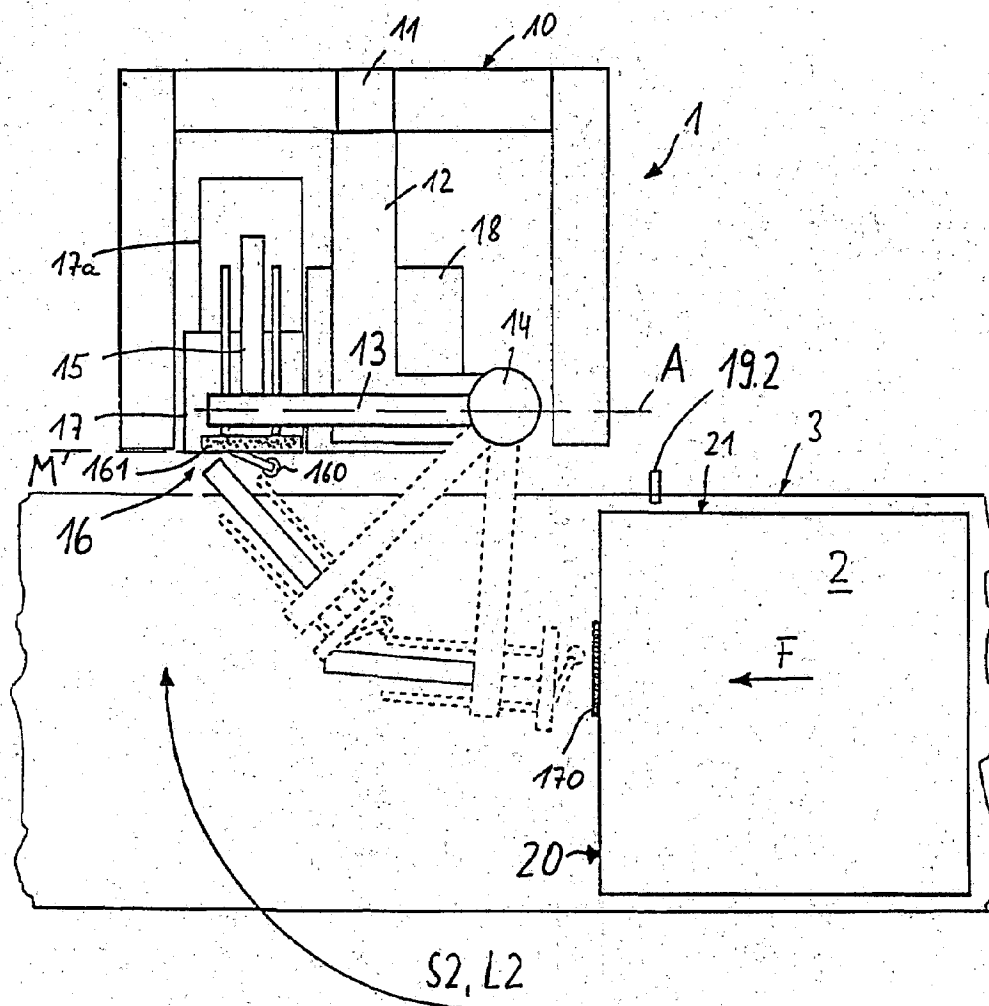


Fig. 4

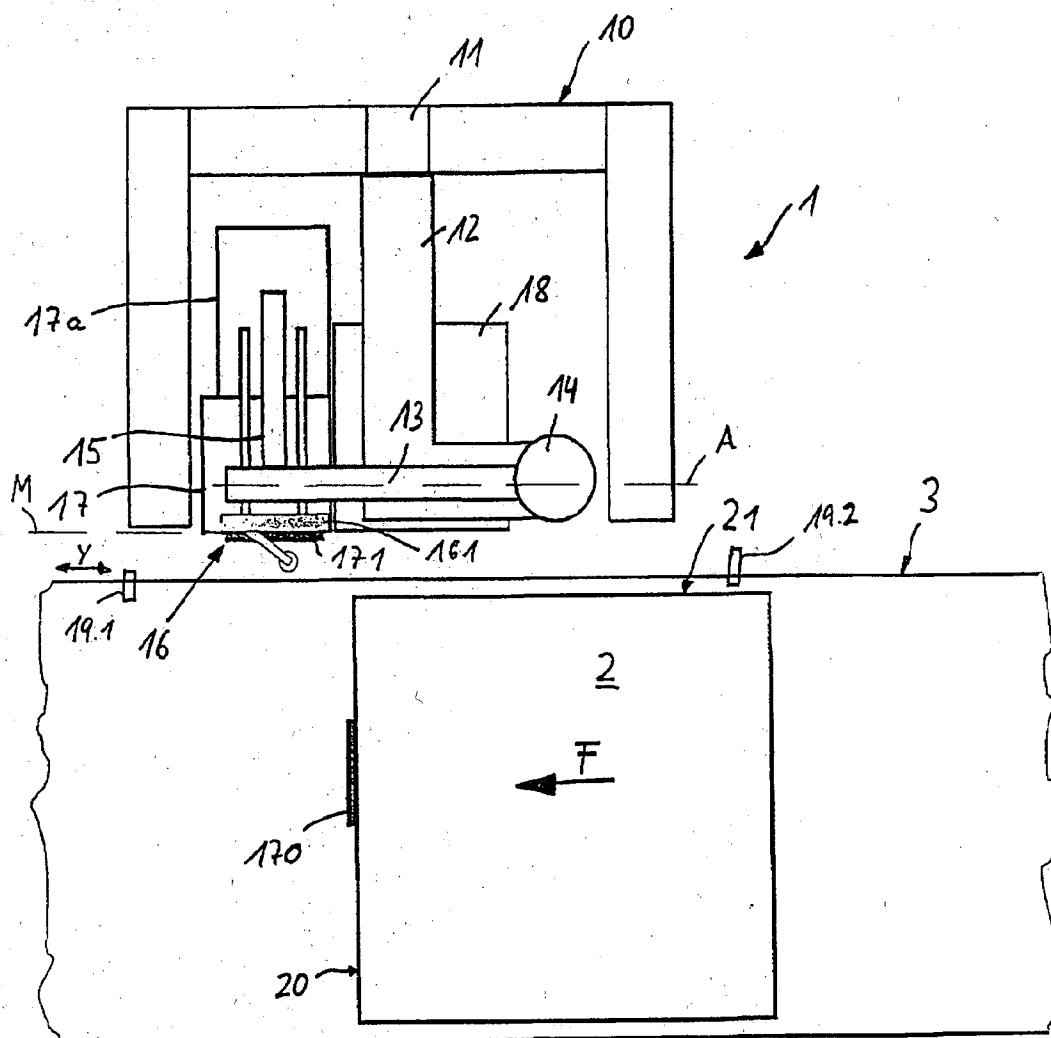


Fig. 5





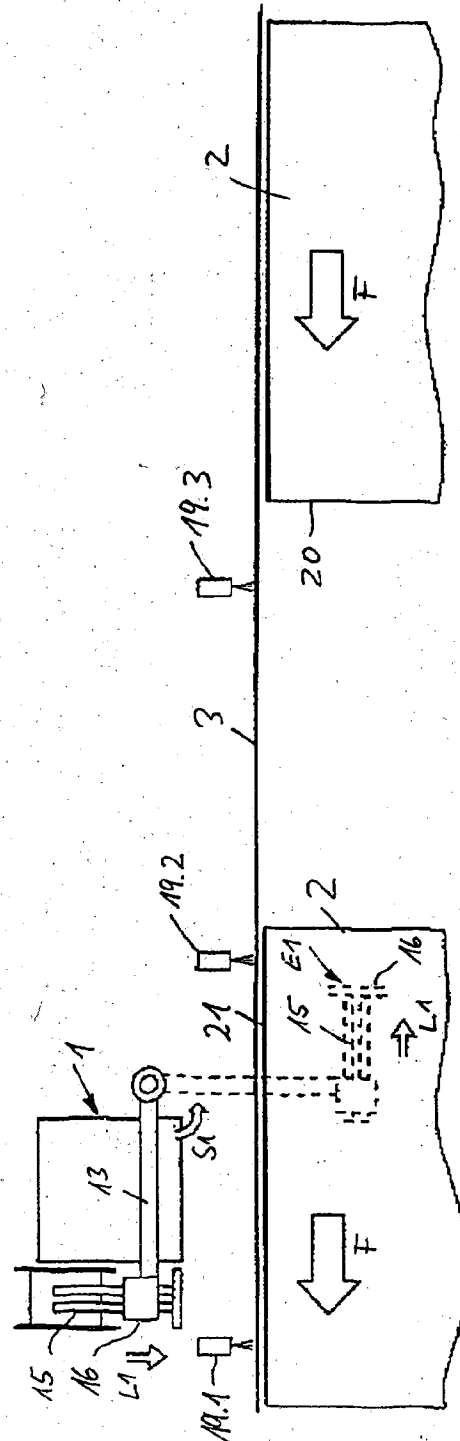
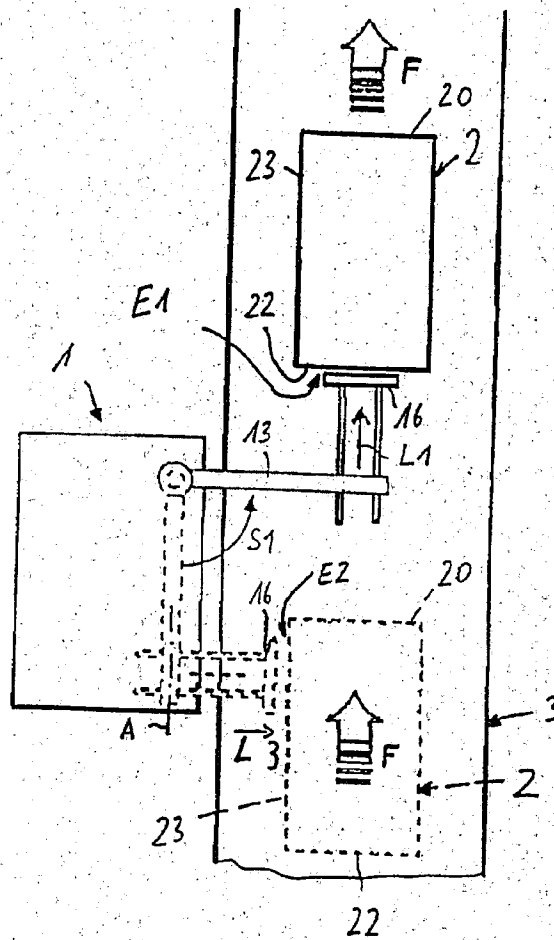


Fig. 7





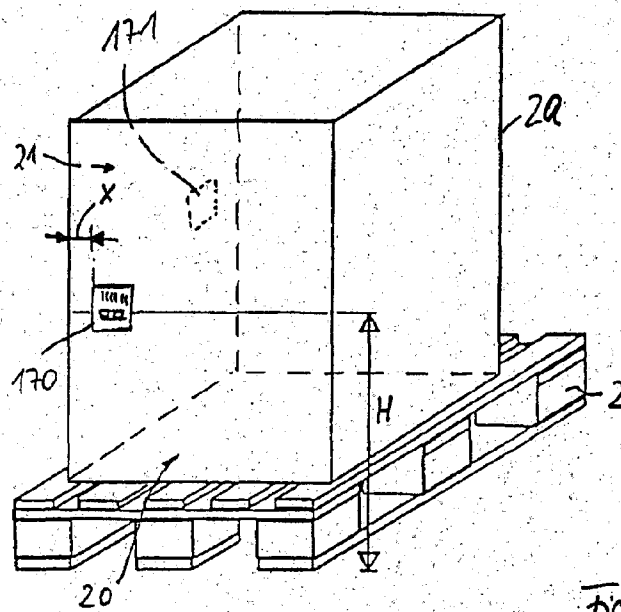


Fig. 10